

# Flight

A Journal devoted to the Interests, Practice, and Progress of  
Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE AERO CLUB OF THE UNITED KINGDOM.

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## FLIGHT.

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**NOTICE.**—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Thursday. The latest time for receiving small alterations for Advertisements is 12 noon, Thursday. No alterations can be made after that hour.

**NOTICE.**—Complaints continue to reach us of the difficulty experienced in obtaining copies of FLIGHT regularly in certain districts. We would therefore point out the desirability of placing a definite order with the local agent to supply a copy EVERY Saturday.

## A PIONEER DIFFICULTY, AND A "FLIGHT" OFFER.

IN these early days it is inevitable—and every week it becomes more obvious—that one of the chief obstructions to the rapid progress of the aeronautic industry is that of individual isolation, and a lack of introduction between the various persons who are desirous of taking an active part in the movement. Clearly the initial stages in any country must be those in which the mechanical talent of the nation is put into close touch with the capital of the land. And although this process is one which essentially occupies time, yet anything which can hasten it is all for the good of the cause. Already there are numerous inventors who have more or less developed their ideas by means of models, but are prevented from proceeding further from lack of the necessary funds. Similarly, scattered over various parts of the country, there are hundreds of men, having the necessary qualifications, who are desirous of entering the aeronautic field both to

learn the art of flight and also to give those very services which every invention needs when passing from the hands of the inventor into the everyday world of use. And last, but not least, there are those whose means enable them to satisfy the very human inclination to play the part of financier at a time when prizes are apt to be great, even if the speculative element is also large. In other words, the difficulty of which we speak is that of the inventor, the designer, the practical enthusiast, the experienced organiser, and the capitalist to find one another at the very time when the most precious moments to the future of the *British* industry are passing by, with all too much celerity.

Having stated the difficulty, we may now pass on to the offer which, after mature consideration, we have decided to extend to our readers. For a time, at any rate, we are willing to keep a register of all those names which may be submitted to us by anyone who seeks to be put in touch with other pioneers; and this we are prepared to do without any direct or indirect profit to ourselves. The entries will all be classified in accordance with the general requirements of the various applicants; and the fullest particulars are invited, for this purpose, in each case. Needless to say, any supplementary information that is imparted to us for our own guidance will be treated in the strictest confidence, to whatever extent may be indicated by the applicant; our object being rather to act as mere intermediaries—with the least amount of clerical work to ourselves—than to throw open the register to those who could make improper use of the information it contains. This scheme is, of course, quite distinct from anything that we do in the way of helping those who seek our advice upon any aeronautic venture in which they are concerned, for although the scheme may often prove of very great assistance to those correspondents also, yet nothing connected with their communications passes further than the editorial desk unless a direct request is expressed to the contrary. We need hardly point out that the services which we propose to place at the disposal of readers of FLIGHT are those which are usually obtainable through the medium of advertisement only; and consequently it will readily be understood that we do not undertake to continue the scheme after the immediate requirements of the moment have been satisfied. We do not even propose to endow it, at present, with any greater formality than it actually obtains from this article, since it is purely an experimental effort, started to meet a specific temporary want, and time alone can dictate its utility or further development.

# A MODEL WHICH FLEW IN 1893.

THERE are few departments of science in which the Hon. C. A. Parsons—whose name as an engineer is so well-known to the public at large on account of his successful development of the turbine engine—does not take a deep and practical interest; and it will be no surprise to those who know him, to hear that he was conducting experiments with a model flying machine as long ago as 1893. It is of more unexpected interest, however, to know that he

enough the year in which *The Automotor Journal* first saw the light, and at a time when petrol engines hardly offered the same obvious solution of the problem that they do to-day.

"In the summer of 1893 I made some experiments on the effect of steam-jacketing small steam-engine cylinders by placing the whole of the cylinder and valve-chest inside the boiler. The increase of economy was so marked that I was led to try whether a small toy engine could be made to sustain its own weight in the air by the lifting power of an air-screw on the crank-shaft.

"Fig. 1 shows this little engine. The boiler is of seamless steel,  $2\frac{1}{2}$  in. diameter, 14 in. long, and .01 in. to .015 in. in thickness; the steam cylinder, single acting,  $1\frac{1}{4}$  in. diameter by 2 in. stroke, and about .03 in. thickness of tool steel; the piston is of thin cup form, also of tool steel; the admission-valve is cylindrical,  $\frac{5}{16}$  in. diameter, cutting off at  $\frac{3}{4}$  stroke. The whole of the valve and cylinder are within the boiler. Some parts of the engine were soft soldered and some hard soldered; the screw is of cane covered with silk. The working pressure was limited to about 50 lbs. per sq. in. The total weight of the apparatus, with water, as in Fig. 1, is  $1\frac{1}{2}$  lbs.

"Steam was raised by placing the boiler over a spirit-lamp, and when 50 lb. was registered on the gauge, and the engine started, it raised itself in the air vertically to a height of several yards. The revolutions of the engine were about 1,200 per min. and the i.h.p.  $\frac{1}{4}$  horse-power.

"The same engine was then mounted on a framework of cane, covered with silk, forming two wings of 11 ft. span, and a tail, the total area being about 22 sq. ft. The total weight was now  $3\frac{1}{2}$  lb., and, when launched gently from the hand in an inclined horizontal direction, it took a circular course, rising to a maximum height of about 20 ft. When the steam was exhausted it came down, having traversed a distance of about 100 yds.

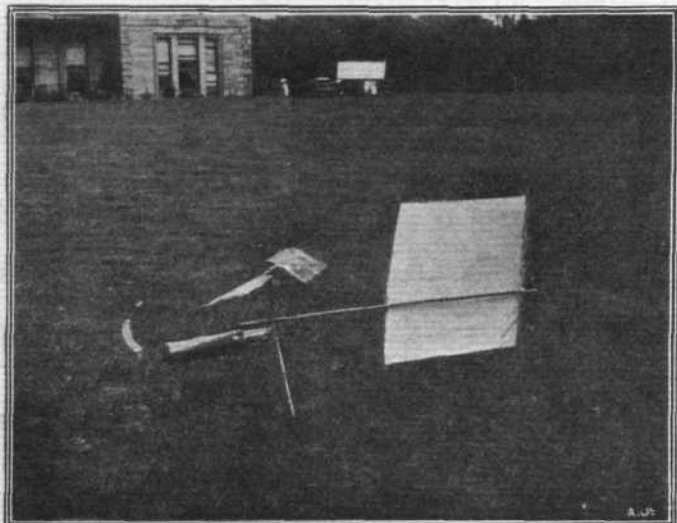


Fig. 1.—Steam engine and boiler working lifting screw; large plane to prevent rotation of boiler; total weight  $1\frac{1}{2}$  lbs.; i.h.p. developed  $\frac{1}{4}$ . Raised itself about 12 ft. in the air with steam contained in boiler. No firing after start. Initial pressure 50 lbs. Maximum revolutions about 1,200 per minute.

actually made an engine-driven model which flew, and that this same model was equipped with a steam engine and a boiler.

Although it is impossible at this late date to give any detailed illustrations of this fascinating little toy, we are enabled, through the courtesy of Mr. Gerald Stoney, who was present on the occasion of the trials, to reproduce a couple of snapshots which he secured when those trials were in progress. One of them shows the machine flying in mid-air, while the other represents an earlier model at rest on the ground, getting up steam ready to fly. The initial experiments were made with a helicopter pure and simple, and it is of this model that the latter illustration was taken. Subsequently, however, the engine was remounted on the model monoplane having an 11 ft. span, which is shown in flight. In both cases flights were accomplished of a nature which would certainly be regarded to-day as of a highly satisfactory character.

The principal interest naturally centres in the engine which was capable of performing these feats, and this model was indeed one of those numerous examples in which Mr. Parsons has shown that it is possible, upon occasion, to obtain extraordinarily big results from installations of small compass. It requires, however, a practical knowledge of steam, such as is not possessed by everyone, to know along what lines to commence the design of such a plant; and yet, as will be seen, the little model was by no means complicated. It was an outcome of some important experiments in another direction, and the principal feature consisted in placing the engine cylinder, together with its valve, completely inside the boiler so as to avoid loss of heat.

As a document of considerable interest, we reproduce verbatim the letter in which Mr. Parsons described his model in our contemporary, *Nature*, in 1896—curiously

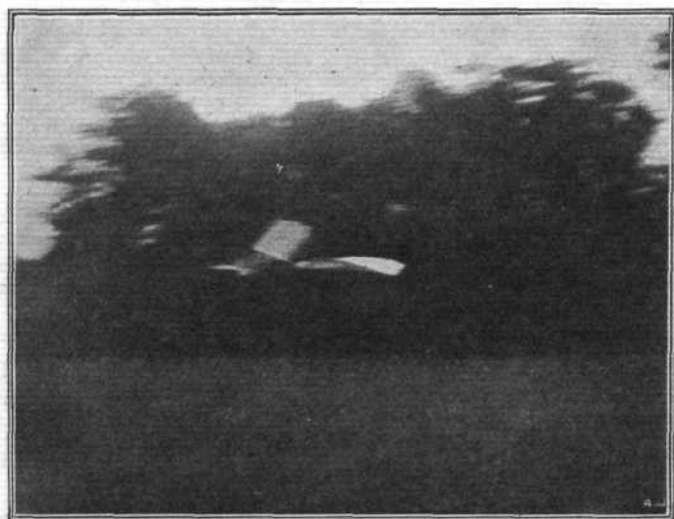


Fig. 2.—Same engine and boiler as before, attached to two inclined wing planes, and tail. From tip to tip of wings 11 ft.; total surface of wings and tail about 22 sq. ft.; total weight of whole apparatus  $3\frac{1}{2}$  lbs. Steam raised to 50 lbs. per sq. in. and started. Length of flight about 100 yards on level; maximum height during flight about 20 ft. The propelling screw is seen in front and above the frame.

"Fig. 2 shows the machine in mid-air. The photographs were taken by Mr. Gerald Stoney.

"Considering the primitive construction of the apparatus, the result clearly showed that flights of considerable distance, possibly some miles, were quite possible with small economical steam engines mounted on aeroplanes.

"The boiler was also found to be able to steam the engine continuously by using methylated spirits instead of water in the boiler, and burning the exhaust as fuel; but when in flight, the force of the wind extinguished the flame.

"It was clearly seen by the experiment that for practical commercial success of this class of steam apparatus an air condenser is essential, as the weight of water used in a few minutes' run equals the total weight of engine and boiler.

"Without a condenser, the length of flight must necessarily be limited to a very few miles, and it would seem that the chief problem that workers in this field have to solve, is to obtain an efficient and light dry-air condenser."



# AERO CLUB OF THE UNITED KINGDOM.

## OFFICIAL NOTICES TO MEMBERS.

### Committee.

IN accordance with the rules, the Committee shall consist of eighteen members. Members shall be elected to serve for two years. One-half of the Committee shall retire annually, but retiring members shall be eligible for re-election.

Any two members of the Club can nominate a member to serve on the Committee, having previously obtained such member's consent. The name of such member so nominated, with the names of his proposer and seconder, must be sent to the Secretary, in writing, on or before Saturday, 27th February, 1909.

The following members have been nominated up to date for the nine vacancies on the Committee:—

Griffith Brewer.	Frank McClean.
Major C. de W. Crookshank.	C. A. Moreing.
John Dunville.	C. F. Pollock.
Capt. A. H. W. Grubb.	J. Lyons Sampson.
Prof. A. K. Huntington.	Stanley Spooner.

### Gordon-Bennett Balloon Race, 1909.

Members are reminded that entries close on March 1st, 1909. The rules were published in the official notices of January 30th. An entry has been received from Mr. Griffith Brewer.

### Gordon-Bennett Aviation Cup.

Members are reminded that entries close on Feb. 27th, 1909. Full particulars will be found in the official notices of February 6th, 1909.

### Aero Exhibition at Olympia.

The Aero Exhibition at Olympia, held by the Society of Motor Manufacturers under the auspices of the Aero Club of the United Kingdom, will take place in March, opening on the 19th and terminating on the 27th. Members of the Aero Club will be admitted free on production of their Aero Club membership cards. A room will be placed at the disposal of the members during the Exhibition.

Free space will be granted to non-trade members of the Aero Club and the Aero Club League for exhibiting their machines, and applications should be made as early as possible to the Secretary of the Aero Club, 166, Piccadilly, London, W.

### Model Flying Machines at Olympia.

It is proposed to organise an exhibit of model flying machines at Olympia in connection with the Aero Exhibition in March. Those desirous of exhibiting are requested to communicate with the Secretary of the Aero Club, 166, Piccadilly, London, W., as soon as possible. Money prizes, medals, and diplomas will be awarded by the Aero Club of the United Kingdom. Free space will be given to exhibitors.

### Reading Room for Members.

A number of members are possibly not aware that the Club have a reading room at 166, Piccadilly. Papers dealing with aviation are placed at the disposal of the members, and the Committee are taking steps to form a library.

### Monthly Club Dinners.

The monthly dinner (5s. 6d. each) is held on the first Tuesday in each month at Jules's Restaurant, Jermyn Street, London, W., at 8 o'clock. Members wishing to attend are requested to notify the Secretary at least one day beforehand. Evening dress optional.

### New Members.

The following new members have been elected to the Aero Club:—

Capt. W. H. Benett.	Edward Pope.
Dampier.	Allen H. P. Stoneham.
Chas. G. Grey.	Charles Frederick Wahl.
Lieut. Thomas Gerard	Capt. Arnold Stancombe
Hetherington.	Wills.
Charles Jarrott.	Capt. E. Trevor Wright.
Henry Thomas Perkins.	

### Aero Club Challenge Cup (presented by Mr. John D. Dunville).

The following rules will govern the competition:—

1. The Cup will be awarded on January 1st, in each year, to the member of the Aero Club of the United Kingdom (whether the aeronaut in charge or not) who, after giving due notice to the Secretary of the Club of his or her intention to compete for this Cup, has performed the longest voyage in any balloon, airship, or aeroplane (irrespective of weight or size) during the past year. The Cup shall be held by the winner for the year following that in which the Cup was won, and in the event of the Cup being awarded to the same member on three consecutive occasions it shall become his or her absolute property.

2. Although only a member of the Aero Club of the United Kingdom can compete for the Cup, such competing member may be accompanied by as many persons as may be desired, and although such accompanying persons need not be members of the Aero Club of the United Kingdom, none of them may be professional aeronauts.

3. Officers connected with the military ballooning establishments of this or other countries shall not be deemed professional aeronauts.

4. The start may be made from any place in the United Kingdom, and the voyage performed need not be confined to the limits of the United Kingdom.

5. The places of departure and descent must be properly authenticated to the Committee for the time being of the Aero Club of the United Kingdom, who shall be the sole judges of the distances covered, and of the question as to who shall be adjudged the winner of the Cup.

6. The words "longest voyage" in Rule 1 refer to the distance covered, measuring in a direct line from the place of ascent to the place of descent, and do not refer to the time occupied by the journey.

7. No temporary descents shall be made.

8. The Cup will not be awarded for any voyage of less than 150 miles.

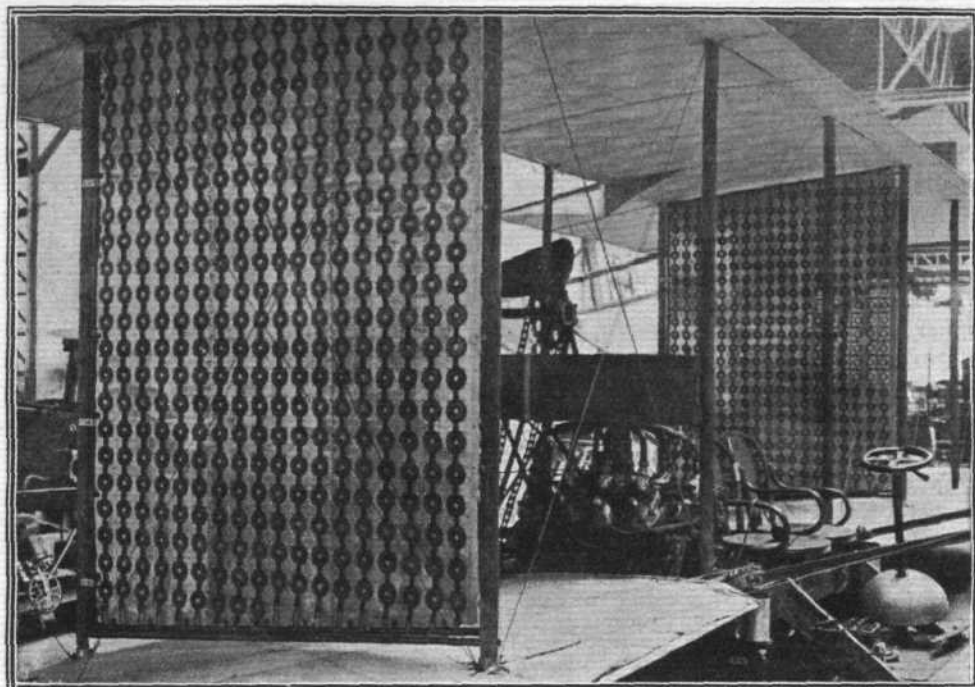
The entrance fee for each ascent is 5s.

HAROLD E. PERRIN,  
Secretary.

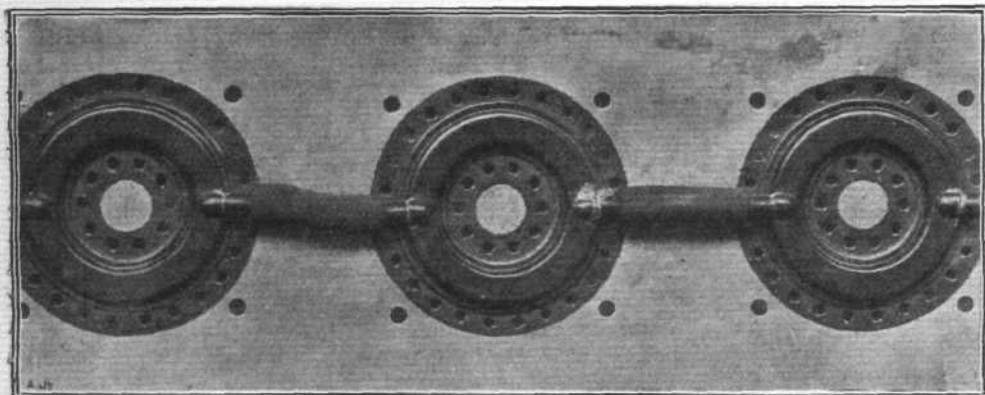
The Aero Club of the United Kingdom,  
166, Piccadilly, W.

## THE BLERIOT FLEXIBLE RADIATOR.

IN order to dispose of the radiator necessary to cool the circulating water in a more advantageous manner on his aeroplane, M. Bleriot has designed a device which he terms a flexible radiating surface. This was referred to in *The Auto-motor Journal* a few weeks ago. It consists of a sheet of aluminium closely covered on one side with hollow brass rings, which are joined together in rows by short lengths of flexible rubber tubing. The cooling water circulates through these rings from one to the other, and is collected by the usual pipes communicating with the pump and the engine water-jacket respectively. On the Bleriot biplane No. 10 the aluminium sheets are arranged like side-curtains between the uprights supporting the two decks of the machine. The two sheets together carry about 800 rings, which afford a total of about four square feet of direct cooling surface. On the



BLERIOT'S BIPLANE.—General view of the central portion showing the radiators in place, the seats, steering wheel, propeller, &c.



BLERIOT RADIATOR.—View of part of the Bleriot flexible radiator, showing three of the annular water rings which are coupled up together by short rubber tubes. The hollow rings are fastened to sheet aluminium merely by the act of punching the perforations which will be noticed round them.

monoplanes the radiator forms part of the surface covering of the body, which consists of a longitudinal girder. The rings are individually fastened to the aluminium sheeting by the act of stamping perforations in their flanges; this process causes a "burr" to be formed, which affords sufficient grip.

The illustration of the radiator in place on the aeroplane shown above gives a good impression of the arrangement on the biplane, but this device is also incorporated in another way on the two Bleriot monoplanes.



### The New York World Prize.

LAST week we referred to the offer by the *New York World* to give 10,000 dollars to the man who should duplicate, in the air, the first journey of Fulton's steamship, and this week we give the full conditions attached to the prize. It will be seen that the contest will be managed by the Aero Club of America and that it is open to any form of airship or flying machine. The distance from New York to Albany is 142 miles. The proposal seems to have aroused a good deal of interest in America, and it is announced that Capt. Baldwin, A. Leo. Stevens, Charles J. Glidden and Mark O. Anthony have already entered. The following are the conditions:—

1. The *New York World*, for the encouragement of the science of aviation, offers a prize of 10,000 dollars for the duplication in an airship or flying machine of Fulton's feat of 100 years ago.

2. The contest will be held during the Hudson-Fulton celebration, in September and October, 1909.

3. This contest is open to all the world.

4. Any form of airship or flying machine that is mechanically propelled is eligible.

5. The course will be up the Hudson River from New York to Albany.

6. The starting point will be within the bounds of greater New York and the finish any spot within a radius of ten miles of the Capitol at Albany.

7. The prize will be awarded to the competitor who first makes the journey from New York to Albany, but if more than one competitor succeeds in performing this feat during any one of the trials, the prize will be awarded to the competitor making the fastest time.

8. The trials will be conducted by the Contest Committee of the Aero Club of America, which is the recognised American and International authority on these matters.

9. Entries must be made to the Secretary of the Aero Club, and contestants will be bound by the rules laid down by the Aero Club of America.

10. Copies of these rules and other information can be obtained on application to the *New York World*, or to the secretary of the Aero Club of America.



## NEWS OF THE WEEK.

### The Olympia Aero Exhibition.

MATTERS in connection with the Aeronautic Exhibition which is to be held at Olympia next March by the S.M.M.T., in conjunction with the Aero Club of the U.K., are proceeding apace. Aeroplanes are big things, but it has been possible to arrange for twelve "stands" in the centre of the main hall, and nine of these have already been allotted. There are also six applicants for the other three spaces, and so there may have to be some rearrangement if all these exhibits materialise. The display of models, which is being organised by the Aero Club, also promises to be a large one, and will probably contain a good deal of interest. Engines and accessories will also furnish many exhibits which should prove attractive, while in the Annexe, motor boats and their fittings will be on view, and doubtless some hydroplanes will be included.

### Flight with a Broken Rudder.

ON Friday, when Wilbur Wright was giving a lesson to M. Tissandier, the steering apparatus gave way at the start, and rendered an immediate descent to earth necessary. The accident happened at the moment of leaving the starting rail, a piece of which in some manner struck the rudder. The spectators, expecting a catastrophe to follow, gave forth a yell of warning. Wright himself failed, however, to hear, and not until he found that his machine was out of control did he realise that some mishap had occurred, when he just planed quietly to earth, the most unconcerned of all within ken of what was going on. Another slight mishap with the starting rail on Tuesday again interfered with a flight.

### Tissandier Learning to Fly.

M. TISSANDIER continues, however, to make favourable progress under the tutelage of Wilbur Wright, and on Saturday succeeded in manipulating the machine for a few minutes by himself, Wilbur Wright having temporarily relinquished his grasp of the levers. Saturday last was the momentous occasion on which this marked step in progress was accomplished, during a flight of 18 miles, lasting 28 mins. 30 secs.

### Wright's Aerial Ramble.

HITHERTO Wilbur Wright has always contented himself with flights which have been more or less strictly confined to the limits of his aerodrome, but on Saturday afternoon he departed from this custom to the no small anxiety of the crowd of spectators. Making an excellent start, Wright "felt" his way for a short flight above the Landes, and then suddenly steered towards the Pau-Bordeaux main road, and quickly disappeared in the distance. For three to four minutes the flyer was completely out of sight, and it requires but a dull imagination to conjure up a mental picture of the state of the crowd as under these conditions seconds slowly elapsed. At last, after what appeared to be more like hours than minutes to the eagerly expectant crowd, Wright's machine once more appeared above the horizon, and in the space of but a few minutes more had settled gracefully to earth near the door of the shed. During his absence, Wright had the novel experience of witnessing the effect of a flying machine upon the horses over which he passed along the road. It appears that their regard for aeroplanes is characterised by much the same fear as at one time they evinced towards the motor car, to which by some

wonderful fundamental principle of the interchange of mental experiences among the species, they so quickly grew accustomed. Or was it that those in charge of the horses conveyed their own nervousness to their otherwise indifferent four-footed companions in toil?

### King Alfonso's Visit to Pau.

ACCORDING to the latest accounts, it seems possible that King Alfonso of Spain may yet visit Pau, although whether or no he ultimately will take lessons in flight over the Landes it is impossible to say. The more probable arrangement is, as we mentioned some time ago, that Wilbur Wright will wait upon His Majesty at San Sebastian.

### Mr. A. J. Balfour at Pau.

AMONG Wilbur Wright's numerous visitors has been Mr. A. J. Balfour, who, with Lord Wolverton, motored over to the aerodrome on Wednesday. A snow storm prevented any flights being made, but Mr. Balfour spent some time discussing flight with Mr. Wright before he returned.

### Bleriot Visits Pau Again.

BLERIOT has paid another visit to Pau, and he has determined, it is stated, to shortly return, taking with him one of his aeroplanes. At the moment he is making short flights with his short-span machine at Issy.

### The Wright Brothers and a Sculptor.

OUR readers will remember that the Aero Club de la Sarthe have decided to present Wilbur Wright with a memento of his visit, in the form of a statuette depicting the Brothers Wright learning the secret of flight from Nature as represented by an eagle. The sculptor of this allegorical group portrayed the brothers as veritable twins in features, and bald-headed to boot, but now that he has met Mr. Orville Wright nothing contented him but that he should be given the necessary time in which to correct his *slight* mistake.

### Two Wright Machines for Monaco.

ALTHOUGH there is very little reason to suppose, as we stated some time ago, that Wilbur Wright or his brother are in the least likely to compete at Monaco in person, there are now expectations that two Wright machines may be represented there. According to M. Clemenceau, who owns the selling rights, he and Count de Lambert will each take a machine to Monaco for the competition, as soon as they have learned the art of flying. And this, once more according to M. Clemenceau, will be a mere matter of a fortnight or so! The aeroplanes will be equipped with floats in accordance with the regulations of the competition.

### Pau Crowded Out.

WRIGHT's experiments on the Pau Landes are attracting all the more spectators because they happen to coincide with the opening of the racing season, which, as usual, has brought a vast crowd to Pau. Any of our readers who may be thinking of paying a more or less immediate visit to the new aviation centre, therefore, will be well-advised to arrange for their rooms as long in advance as possible.

### Wright and the Chef.

SECOND only in interest to the flights which he has executed, has been Wright's mode of living since his

arrival in France. Nothing is more characteristic of this wonderful pioneer than his unostentatious although perfectly open following of the simple life. He insists in living in his shed, and it is even a matter of doubt as to whether he prefers the relative luxury of his establishment at Pau to his absolutely unadorned abode at Le Mans. Be that as it may, the Pau Committee, who have constituted themselves, so to speak, his guardian body, have insisted on "doing" him as well as circumstances permit, and they have even succeeded in installing in office a French cook, taking care, however, to choose for this purpose an old soldier who has seen active service. Deprived of his oil stove, and with a stranger wielding his fry-pan, it is small wonder that Wright should at first not have welcomed over effusively the intrusion, but it is now said that the arts of the chef have since effected quite an amiable change in feeling.

## A British Engine for Army Aeroplane.

FROM Mr. Fredk. R. Simms we learn that his firm have under construction a six-cylinder V type engine of 50 h.p. which Mr. S. F. Cody intends to fit to his new aeroplane. It is of special design, and it is estimated that it will weigh about  $4\frac{1}{2}$  lbs. per h.p. The cylinders, which have a bore and stroke of 110 mm., are inclined at an angle of 120 degrees.

## Fournier Aeroplane.

HENRY FOURNIER, as we have already announced, is having an aeroplane built by Voisin, on the general lines of the Farman and Delagrang machines. It is being equipped, however, with an Itala engine, and the propeller is so arranged that its speed will be between 1,100 and 1,200 revs. per minute. For this purpose, the propeller is mounted on a secondary shaft, which is geared down from the engine. A minimum of 50-b.h.p. is expected from the motor, which weighs 200 kilogs. Fournier himself is by way of being a heavy-weight, so the machine, when finished, will have to give a good account of its lifting capacity.

## Ouviere Helicopter.

YET another helicopter do we announce this week. It is being built by M. Ouviere, of Marseilles, and is to be of the twin-screw type. These screws will be of different diameters, and will run at different speeds although driven by the same 80-h.p. engine. The total weight of the machine will be 385 kilogs., and it is expected to be capable of lifting a load of 450 kilogs.

## Rumours of a German Helicopter.

WRITING, in his usual lucid manner, of the doings of the European Powers—France, Germany and Italy—and contrasting their aeronautic activities with the apparent indifference displayed by our own Government at home, Mr. H. Massac Buist makes the following statement in the *Morning Post* of last Tuesday:—

"It must not be imagined that because no aeroplane is known to be building for the German Government that the heavier-than-air type of machine is being utterly neglected. To the contrary, I have confidential information concerning what is undoubtedly the most notable design that has ever been brought forward for a screw-lifted machine. The system has given such extraordinary results in models that the Government has been influenced to supply the funds to build a full-scale machine. For patent and other reasons the time is not ripe for describing the details of construction, but it may be hinted that the system enables the whole machine to consist of a giant gyroscope such as would be utterly unaffected by the most violent wind storms, while, in the event of the propelling and lifting power suddenly giving out by accident or otherwise, despite there being no aeroplane surfaces, the machine would not drop to earth, but would act automatically as a mechanical parachute. Not the least

ingenious feature, too, is that the pitch of the lifting screws is infinitely and independently variable from zero to maximum, so that apart from engine regulation the degree of 'bite' or purchase power on the air can be altered instantly and at will."

## Paris and Seine Prizes.

OUR readers will remember that the Paris Municipal Council and the Seine General Council placed sums of 15,000 and 5,000 francs respectively at the disposal of the Ligue Nationale Aerienne for the purpose of founding prizes in connection with an aviation trial to take place this year in the Department of the Seine. The primary conditions of the two prizes were similar, and the technical committee of the L.N. have, therefore, divided the total sum into four prizes, to be awarded in connection with the same event. The event itself will consist of making a flight of 10 kiloms. over a specified course, which will be selected either at Issy or Vincennes. A condition of winning the prize is that the course shall be accomplished in less than 15 mins., and, of course, without touching the ground. Competitors will start in turn and will be allowed half an hour for their attempt. They must cross the starting line flying and may make attempts with as many machines as they please, but may not use the same one twice, nor can they carry off more than one prize. The prizes are as follows:—1st, 10,000 frs.; 2nd, 5,000 frs.; 3rd, 3,500 frs.; 4th, 1,500 frs.

## Santos Dumont Prize.

THE Commission Sportive of the Aero Club of France has officially recorded the award of the Santos Dumont 4,000 francs prize to M. V. Beauclair.

## Triaca Prize.

THE Commission Sportive of the Aero Club of France has decided to award the Triaca 500 francs prize to Wilbur Wright.

## Vichy Prize.

THE Aero Club de Vichy have founded a prize of 10,000 francs for flying competitions to be held in their district.

## Aviation at Mons.

THE Belgian Aero Club have founded an aviation section at Mons under the auspices of the Hainault Automobile Club.

## Austrian Flight Congress.

THE first Congress of the Austrian Society for aerial navigation was opened at Luiz by the Archduke Joseph Ferdinand on Monday of this week.

## Anjou Cup.

THE Angers municipality has voted the transference of the 25,000 francs, originally destined for the Automobile Grand Prix, to the scheme for holding a flying meeting in Anjou.

## Henry Farman—Constructor.

NOT satisfied with his rôle of experimenter, Henry Farman has now definitely entered upon the work of design and construction. He has two machines already in hand, one designed on similar lines to the Voisin biplanes, and the other of quite a different type.

## Maurice Farman Flies.

AT almost his first attempt, Maurice Farman succeeded this week in making a flight of about 300 metres; the machine, however, was slightly damaged in the descent.



### Ligue Meridionale Growing.

THE Ligue Meridionale Aerienne has enrolled its 3,000th member and is now busily engaged on its scheme for an aerodrome between Bordeaux and Arcachon.

### Pen-en-Toul Aerodrome.

COUNT DILLON has offered some of his property at Pen-en-Toul, measuring 130 hectares in extent, for the purpose of an aerodrome. It is stated that at least 80 hectares could be very easily rendered suitable for flying experiments.

### Rheims Circuit.

ACCORDING to M. Surcouf, it appears that the aviation week at Rheims is to include events which will be divided under four headings. In this way it will be sought to separate biplanes from monoplanes, and to include in the programme trials of distance as well as trials of speed. It will probably be arranged to have a recognised hour of starting on every day of the week for entrants who wish to make a trial on the distance course, and similar facilities will probably be given in connection with the other events. Speed trials, it is suggested, may take place over a 10 kilom. and 1 kilom. course, and there will probably be a special prize for passenger flights. The "big prize" of the meeting will be valued at 50,000 francs, but the total prize fund, as our readers know, amounts to 150,000 francs. The dates selected at present are from August 22nd to August 29th, or from the 5th to the 12th of September.

### Flight "Landings."

THE ever-active Ligue Nationale Aerienne has addressed a circular to the Mayors of the principal French towns calling their attention to the advisability of trying to provide landing grounds for flyers, and to have them suitably marked out.

### Flight in 1800.

AT the age of 71, General Resnier, so a story goes which comes from France, conceived the very patriotic project of embarking a French army corps on flying machines for a visit to *Angleterre*. Having the courage of his convictions, he set about forthwith to show the feasibility of flight, and for this purpose constructed a flapping wing machine with which he jumped off the ramparts of Angoulême in the year 1800. On the first attempt the river received his body together with the machine. Both were rescued safe and sound; but on the second attempt he landed on *terra firma* and broke his leg, after which the crisis, so far as this country was concerned, happily came to an end. It is worth putting on record, however, that from an altitude of 68 metres, the General was able to cover on the first attempt 180 metres, and on the second attempt 200 metres in horizontal distance before he "landed."

### Benjamin Franklin on Flight.

IN a lecture which Lieut. Frank P. Lahm recently gave before the American Society of Mechanical Engineers, he mentioned that among the spectators of one of the earliest ascents of the Montgolfier hot air balloon was Benjamin Franklin. A pessimist availed himself of the opportunity to address a query to the illustrious American as to the utility of balloons, which drew forth the terse but eloquent reply, "Of what use is a new-born babe?"

### Flight at the Coliseum.

A NEW "turn" was put on at the London Coliseum this week, entitled M. Noiset and his flying bicycle, and,

judging by the nature of the performance, it would seem as if this latest "star" from France will have very good reason to wish to fly on his own before he and his machine and the revolving stage have had a much more extended acquaintance. M. Noiset looks comfortable enough so long as he remains securely aloft in the air, and the extraordinary arrangement of drapery which adorns his bicycle successfully obscures his blushes from the audience—as well it may. Once he has blown that fatal whistle which is the signal for his descent on to his little revolving stage, however, the trouble—or the fun, according to the point of view—commences. We can conceive that it might not be an easy feat to maintain perfect composure, even when alighting on *terra firma*, while seated on a motor bicycle in full action, even if the machine is supported—by wings. But to be expected to make a landing on a wobbling revolving stage must surely be beyond a joke, and as M. Noiset does not profess to be either an acrobat or a trick cyclist, and gives no indication of having a special aptitude for either of these very honourable professions, we can thoroughly sympathise with his feelings, as he is caught by the whirling stage and is more or less speedily swept over the edge of the table, what time the curtain descends to hide the climax. Turning to matters more serious, we can recommend our readers to enjoy the cinematograph views of the Wright flights which are now being reproduced at the Coliseum, for they are exceptionally good in many respects, and the cinematograph affords quite an extraordinary method of appreciating in advance some of the wonders and beauty of the new art.

### Revolutionaries and Flight.

AZEFF, the notorious Russian police emissary and "plot" organiser, is said to have declared that the old-fashioned methods of assassination by revolver, knife and bomb stand no chance nowadays, and that the aeroplane should be used in future attempts. It is not stated, however, what precise part the aeroplane would play in the dark deed, but presumably it would deal destruction upon Imperial residences from above.

### Forty Italian Dirigibles.

THE Italian Budget, it is reported, contemplates the construction of 40 military dirigibles, while six army airships are, it is said, already in course of construction. These are expected to be ready in time for the next manoeuvres, which take place in the spring, while a reinforcement of twelve others are to be in the air when the army once more takes the field in summer. At this rate it looks as if Italy did not mean to be left out in the cold when the supremacy of the air is under discussion. But doubtless by the time we see the first half-dozen of these machines successfully "advancing in column" in their natural element, progress in this and other countries in the same direction will not have remained entirely stationary.

### U.S.A. Army Dirigibles.

PLANS are being put in hand for the design of two airship sheds, to be erected at New York and Washington, for the use of the U.S.A. Army airships. The sum of 100,000 dollars will, it is stated, be needed to cover the cost of these buildings.

### An Aerial "Lusitania."

IF Mr. Thurlow Weed Barnes, the American railway magnate, is to be credited, England possesses a millionaire whose ideas run on very up-to-date lines, for he is said to

have ordered (in America, of course) a huge airship, the car of which will be over 700 ft. in length. It is unfortunate that no details are forthcoming as to the means which are to be adopted to keep this huge vessel afloat in the air, but by way of compensation full particulars are given of the passenger accommodation. There will be four first-class staterooms arranged similarly to those on a large yacht, and the dining room, to seat fourteen people, will have stained glass windows. There will also be an observatory, furnished with fourteen chairs, a divan, and a writing desk. Arrangements are to be made for carrying ten servants, and the larder will be stocked with sufficient provisions to keep thirty people for sixteen days. All the lighting and heating will be done by electricity.

By way of showing that the above is not a particularly "tall" order, the company which is to build it is said to have under construction at the present time a steel airship 1,000 ft. long, to carry 100 passengers.

## Cross-Channel Ballooning.

ON Friday of last week Messrs. C. F. Pollock and P. Gardner made the first cross-Channel balloon trip of the year. Starting from Battersea at 10.20 p.m., they reached Crépy-en-Valois, about 200 miles distant, at 8.30 on the following morning.

## The Wrights to Visit England.

AT the invitation of the Aeronautical Society of Great Britain, we learn that the Wright Brothers have notified their intention to pay a visit to London at the end of next month, when the gold medal of the Society will be presented to both brothers, and when it is prob-

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# FLIGHT AND THE RIGHT TO FLY.

MAJOR B. BADEN-POWELL, in an interesting letter to the press recently, discusses the problem (which is before long likely to become acute) of international control in the air. Major Baden-Powell writes as follows:—

"Every judicious politician must look to the future rather than to the present. Changes in the laws of the country cannot be carried into effect in a moment, and what has to be considered is the state of affairs which will exist when such new laws become effective. So, too, in contemplating what the future may bring, it is desirable that legislators should devise laws applicable to the impending situation.

"We are now confronted with a most intricate and difficult question of international politics, one which in the future is bound to lead to complications and controversies. Already, it is said, the French Government are considering the matter.

"It has been clearly demonstrated that apparatus can now be made—whether dependent on displacement or dynamic power—which can carry men through the air in a practical manner; and there seems to be every probability that within the next few years many machines will be constructed capable of travelling hundreds of miles through the air, swiftly, surely, and safely. Such vessels, moving independently of fixed tracks and regardless of boundaries such as we respect to-day, must be of great military value; they will certainly be much used for sport and pastime, and will in all probability soon be employed for such purposes as postal delivery, transport of light goods, and conveyance of express passengers.

"If, then, such machines are to become at all common, it is very evident that laws must be made and modified to meet the new circumstances.

"The first and one of the most important questions calling for solution is that regarding international frontiers, seeing that neither walls nor fences, mountains nor rivers, not even seas, offer insurmountable barriers. Are these airships to be allowed to traverse frontiers freely, regardless of passports, independent of Custom duties, defiant of bans of exile and laws of immigration? Are they at liberty to hover over fortifications, arsenals, and dockyards?

"Secondly, there is the very serious question of private boundaries. Are these 'air-hogs' (as they are sure to be dubbed) to be allowed to pass over our private property? May they glide over our chimney-tops, or skim close above our lawns and flowerbeds? The law of trespass is intricate as it is, and if proof of

able that an inspection will be made by them of the Society's trial ground at Dagenham.

## An Aerial Torpedo.

PERFORATING the gas-vessels of balloons by rifle shooting, or even by the projectiles of larger guns, does not necessarily have the effect of placing the aerial craft out of action. Assuming that the gas is not ignited and that the rent in the envelope is not large in proportion to the total area, the escape of gas is not very rapid, the balloon or airship, as the case may be, is still able to continue its journey to a place of safety. If the envelope could be struck by a special form of projectile resembling in its effect the submarine torpedo, however, the resultant explosion should certainly have the most disastrous effects, and already a device has been invented in Germany to bring this about. The patent (No. 42673) is being worked out in the famous Krupp works at Essen, and the feature of the aerial torpedo consists in fitting a spongy platinum plug in its point, so that ignition of the charge automatically takes place in the presence of the hydrogen contained in the balloon. Inside the torpedo is a small cylinder containing liquid oxygen, and another explosive charge.

## A Significant "Straw."

AT showing the direction in which the wind is already setting, in the upper strata, it is not without interest to record the appearance of a certain small advertisement in FLIGHT, and the fact that several answers have been received by the advertiser. That which was sought for was employment as mechanician to an aviator.

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damage to property is its mainstay it seems wholly inapplicable to aircraft. Damage due to accidental landings, as well as from articles dropped from above, is another matter. Then there must be consideration for enclosures where sporting and other events take place, and where entrance money is collected. In a few years we shall have the course at Epsom darkened by a vast flock of human vultures vying for places over the winning post! Even if flyers are to be allowed to cross high up in the sky, how can we limit the extra height at which they may travel!

"If definite laws are adopted controlling such matters, we then get to the still more perplexing problems of how to police these realms of blue. It is all very well to dictate regulations for aerial traffic, but how is the law to be maintained? Machines travelling at a speed of thirty or forty yards a second get such a start that they cannot easily be followed, and, unconfined to definite tracks, the transgressors cannot be detained on arrival at their destination. If all machines are to bear registered numbers or means of identification, there must be some international understanding about it; for in time we may have, for instance, thousands of Germans migrating over our heads to America?

"All this may read as a huge joke, but who can deny that such problems may demand our most earnest attention in the near future? And they must be considered while there is yet time.

"One of the first matters to decide upon is as to who is to be considered the responsible head in such affairs. Are these questions for the Home Office, or is the Board of Trade to have control? The Foreign Office and the Defence Committee will also want to have their say. Then how are such difficult issues to be decided when we have no experts with any experience of aerial navigation (beyond a few trials in very primitive apparatus)? The council of the Aeronautical Society of Great Britain is now considering the various points of importance, and may be able to lay valuable suggestions before such a body as is finally appointed to control those going up in the air in ships. Probably the Aero Club, too, and other bodies may be able to offer good advice. But such institutions cannot make the laws.

"In this connection it may be added that an international meeting of aeronauts was held in London recently; but this only assembled with the object of settling certain points in connection with balloon races and other sporting events, and could not, of course, deal with these vast questions of legislative control."



## CORRESPONDENCE.

\* \* The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

## PROPELLERS AND MOTORS.

To the Editor of FLIGHT.

SIR,—With reference to my letter *re* propellers (January 30th), and Mr. Hollands' criticism (February 6th), the words type and proportion were not used in connection with propellers but in connection with aeroplanes of which the propeller is only a necessary component. This disposes of any "notions" which I am supposed to have formed on the subject.

What I do say is that a propeller varies in pitch, diameter, and blade-area as the aeroplane varies in size, weight, speed (which is governed by canvas-area and weight mainly), and the resistance of the particular type of aeroplane, and until an experimenter has determined which machine he may require to have fitted with a propeller and the amount of power required to drive it, the manufacturer of propellers is as "much in the dark" as the experimenter with regard to highest efficiency.

I have no wish to enter into any acrimonious discussions with regard to the merits or demerits of any particular "confection," but may I ask if Mr. Hollands has tested his own propeller against a "Voisin?" If so, what were the results? And if the results were highly favourable to the "Hollands," why are not all the present flyers fitted with a "Hollands?" Surely this should be the case, and I think if such a saving could be effected in power the aeronauts desiring to excel would "jump at the chance."

I must say that I am surprised at the acrimonious tone of some of the correspondence. It is such as one might expect from school children and not from men of brains seriously studying one of the deepest subjects in connection with modern science.

I may add that when writing I had no thought of Mr. Hollands or anyone in particular, but only of the subject of which I was writing, in which I am more highly interested than in anything or anyone, and I have no "axe to grind."

Yours very truly,

MONTFORD KAY.

Feb. 8th.

## TERMINOLOGICAL INEXACTITUDES.

To the Editor of FLIGHT.

SIR,—Believing as I do, that "ornithoptics" or the science of bird-like flight is the branch of aeronautics which will claim most attention later on, may I trespass on your valuable space once more to say that I hardly think that you have proved your point in your reply to my letter of last week under the above heading. While you admit that the word "ornithoptère" is used for a class which has bird-like wings, you disallow the word because the wings of this class of aerial vessel are not covered with feathers. But neither are they densely reticulated (membranous) wings (like the grasshopper), therefore on such a ground "orthoptère" must be vetoed also. I the name of this class of vessel were to depend on the material used for the covering of the wing there would be no end to the nomenclature. I submit with all due deference to you that as the class of aerial vessel under consideration is admittedly bird-like and *not* insect-like, the term "ornithoptère" is more appropriate than "orthoptère."

Edinburgh.

H. A. SULLIVAN,  
Major, A.V.C.

## TO THE NORTH POLE IN A FLYING MACHINE.

To the Editor of FLIGHT.

SIR,—Kindly accept my profound thanks for so courteously publishing my previous communication and which encourages me to reply herewith to the striking note embodied in the letter of Mr. Sandon Perkins on the above subject. Polar exploration by dynamic aerial ship has long proved a fascination to myself, dating, in fact, with the same number of years that I have studied aviation—from my earliest memories.

Your correspondent asks for advice respecting the best route from England to the Pole and the most practicable type of machine wherewith to conquer the whirls and eddies of atmospheric space with the resultant conquest of the elusive north polar ice-cap, suggesting moreover Smith's Sound *via* Spitzbergen. To the first, the answer is by air, to the second I have no hesitation in advising, without fear of contradiction from *any man living*, the advanced mechanically-driven winged type advocated by Joubert, Rénard, Hollands, and McKee, or the advanced homogeneously designed helicoptère-winged machine believed in by such *scientists*

as Kress, Edison, Davidson, and yours respectfully. To the aeroplane fraternity attempting such a feat the result would prove abortive, useless, and suicidal, as this incomplete branch of flight is in practice simply "fair-weather" craft having no real analogue in Nature. To such partisans of these dangerous power-kites who claim that as yet no helicoptère nor wing-machine has yet flown whilst the aeroplane has been towed and driven by screws to distances approaching 100 miles, and, backed by well-known adherents, aided by superb mathematical formulæ, *velocity* is the key and solving of the problem of both longitudinal and transverse or lateral stability, I say by all means endeavour to navigate the swirls and edding currents of air, now vertical one moment, then horizontal, again quiescent, by such inadequate lines, and I wish them joy of the job.

Having, Sir, already promised future communications for the assistance of other aeronautical students embodying concisely natural laws in addition to physiological and morphological data, I will content with replying to Mr. Perkin's request. The most feasible and *practical* method of reaching the Polar regions by fields ethereal is by a machine designed on the principles of Nature *by man's methods*. Speaking for my own line of research, I would construct an helicoptère of 60 ft. length with ten suspensory helices 10 ft. in diameter, each spinning in inverse directions, the hull of the vessel formed mainly on the lines of the fast flying birds of the swift, albatross frigate-bird, or tern species. These ascensional screws as employed by myself are combined *propellers and elevators*, the axis of same being perfectly vertical, and would lend themselves to engines of 200-b.h.p., *not* petrol, which are as yet unreliable. Automatic parachutes would be added to prevent collapse *if* one of the suspensory helices should break. I would furthermore advise taking two independent engines, one for working, the other for emergency. Now taking approximately the distance from London to the Pole as the crow flies as 1,500 miles, our "Clipper of the Clouds" would require a normal speed of 50 miles per hour to fly for 30 hours this distance, not by any means an hypothetical voyage.

And now for the technical and practical question of lift, drift, and power. The Wrights' aeroplane we know has lifted 84 lbs. per horse-power. Can the lifting screw accomplish this in practice? Yes. The finest, advanced, and most scientific helicopteral experimenter of modern times, Mr. G. L. O. Davidson, has actually built and tested a large machine with twin screws 27 ft. in diameter each, which lifted a weight of 3 tons with only 80 h.p., placing far in the shade Maxim's lift of 8,000 lbs. with 363 h.p. Herein, therefore, lies the undisputable fact, the superiority of a *scientific* machine over the monstrous, incomplete, and dangerous aeroplane. Surely it requires no additional words of mine to enhance the questions of the impossibility of our machine with its ten combined suspensory and propulsive helices irresistibly forging a path through the fluctuations of aerial currents, overturning whether navigating such at either low heights or soaring to the limits of respirable air! Allowing only 50 lbs. thrust per horse-power, we secure a lift of 10,000 lbs. in round numbers, a sum far in excess needed to construct machine, two operators, stores, fuel, &c. I shall be happy to advise Mr. Sandon Perkins further, and will assist all I can to foster and advance the movement, although financially my aid would prove a nonentity.

In conclusion may I enquire of Mr. Hollands (in no unfriendly spirit, as personalities will never help on the problem) why he condemns and considers the helicoptère as impracticable.

I am, Sir, yours sincerely,

EDGAR E. WILSON.

Pimlico.

## ENGINES FOR MODELS.

To the Editor of FLIGHT.

SIR,—If "Bi-plane" will give the width and depth of planes so that the area may be obtained, I shall be pleased to give what advice I can without knowing many necessary details which conduce to perfect flight.

If the machine is under 10 sq. ft., I should advise "Bi-plane" to make a larger, say 15 sq. ft.

Yours very truly,

MONTFORD KAY.

To the Editor of FLIGHT.

SIR.—*Re* Mr. Kay's letter in answer to mine of the 26th ult., I leave it to your readers to judge whether storage batteries of any description are suitable for aeroplane work. Mr. Kay states that the weight of the accumulator used by him was 2½ lbs. This would allow for a capacity of about 10 ampère hours continuous; and, if discharged at 10 ampères, at 4 volts (which would certainly no be good for the accumulator) 40 watts would be expended upon the

electric motor, which is equal to about  $\frac{1}{30}$  of an E.H.P. Now, it follows that, if  $2\frac{1}{2}$  lbs. is required to develop  $\frac{1}{30}$  E.H.P., it is obvious that 50 lbs. weight would be required for 1 E.H.P.; and this is assuming the high efficiency of 16 watts per lb. of accumulator. He has apparently found out, judging by his answer 5, that batteries, except for ignition purposes, are useless for aeroplane work; and, it seems to me, any sentence with reference to accumulators and electric motors, such as was used by Mr. Kay in connection with aeroplanes, is, unless qualified, very misleading, and likely to incur experimenters in useless expense. I did not ask Mr. Kay as to every type of aeroplane he has made. What I wanted was the classification by him of the various types as used by him in the flights, as stated in his letter of the 15th ult.; and my letter of the 26th ult. was not intended to be sceptical. I shall follow any competitions for model aeroplanes with interest, so that I may have the pleasure of congratulating him upon any success that may attend his efforts.

Yours faithfully,

Belfast, Feb. 8th.

WALTER N. CATON.

## AN 11-YEAR OLD "GENIOUS."

To the Editor of FLIGHT.

SIR,—Will you spare a few of your valuable moments to read the enclosed "essay," written by a little girl of eleven? I think it will amuse you, if it does not interest you.

She goes to the root of the matter when she speaks of "resisting gravity." We should apply the principle, not yet discovered, and shoot upwards, I suppose, and then "beat the air by pressure" to travel parallel to the earth. If a second Sir Isaac Newton should come forward to solve this "mistrey," we shall visit Mars before long. Should you think the paper worth printing in FLIGHT, as a set-off to more serious matter, pray use it.

The grammar and spelling leave much to be desired, but the whole thing is funny. Certainly gravity is inconvenient sometimes, especially when daring children climb cherry trees, or aeronauts fall victims thereto.

Believe me, yours sincerely,

M. C. T.

[Enclosure.]

"Essay on the Aro Plane.

"I do not dispute the fact that aro planes will become as popular as moters, for undoubtedly they will. Did not peopl say it was madness for moter cars to be in popular use? Then, why should not Aro planes? I would invent something on that account if I were a genius, and why shoud I not venture to put forth to the public a hint? That if only something were discovered to resist gravity, discovered by Sir Ixa Newton, Oh! that genius! if he had only lived to discover other things, that are at present shrouded in deepest mistrey. As I said before, gravity is an inconvenience in some circumstances, but, What should we do without it? Something should be invented to resist it. Could not some chemist or professor or some such geniuses, make by certain means some metalic substance, that would resist it? Certain, there is something in trying to beat against the air by pressure, testing atmosphere etc, but would not gravity be more interesting a subject, an easy mistrey to solve, at least to someone destined to solve this mistrey. I ertestly hope that the person so destined will discover it in my day so I may understand it myself.

CHRISTINE CROSLAND TAYLOR."

## MAKERS OF AERO MOTORS WANTED.

To the Editor of FLIGHT.

SIR,—I should esteem it a great favour if you would kindly permit me, through your columns, to ask all manufacturers of aeronautical motors, now or about to be put on the market, to be good enough to forward particulars of them to these offices for the information of members.

Yours truly,

T. O'B. HUBBARD, Assist. Sec.

Aeronautical Society of Great Britain.

53, Victoria Street, Westminster, S.W.,  
Feb. 5th.

## NOMENCLATURE—BIBLIOGRAPHY.

To the Editor of FLIGHT.

SIR,—I am much interested in your new journal, not in the sporting parts, but in the engineering and descriptive sections. One or two points have been raised in your correspondence columns on which I hope I may be allowed to say something.

I agree with your correspondent who objects to the word aerodrome being applied to a practising ground for aeroplane machines. Experimental aeroplane machines have been called aerodromes

since 1896 at least, and Prof. Langley's successful model was so described. To attempt to attach a new meaning to a word which has already a definite well-known meaning can only lead to confusion.

Another evil in nomenclature, though one of a different kind, is the growing number of such names as Aero Club, Aero League, Aeroplane Club, and so forth, both at home and abroad. The names represent the evil of a multitude of rival organisations for which there is no need. So far as this country is concerned I can see no use for more than two, or at most three, organisations. The Aeronautical Society should be quite sufficient for those concerned in the scientific and engineering side of the subject, and the Aero Club for those associated with the sporting side. The third association which may be desirable is the League for pushing forward a moribund Government in regard to aeronautics for naval and military purposes.

In regard to the desirable work of compiling a bibliography, I would suggest to you, sir, that an application to the secretary of the Aeronautical Society must result in your obtaining a list of the books in the library of the Society. I do not know the extent of the library, but as the Society has been in existence since 1866 the collection ought to be a good one.

Pending the results of such an application, I have pleasure in giving here, in addition to those mentioned by Mr. Challenger and others, such references as I have at command.

In 1895 the publication was begun, by W. B. Clark and Co., Boston, Mass. (London agents, W. Wesley and Son, 28, Essex Street, Strand), of *The Aeronautical Annual*. I have the volumes for 1896 and 1897, and they contain valuable articles by Lilienthal, Maxim, Langley, Chanute and others. Historically, these volumes are of great importance, and the illustrations are first class. The *Annual* was only published for three years, the 1897 volume being the last. The editor, Mr. Means, seems to have found difficulty in getting a sufficient quantity of good material in those days to keep it going, and no doubt the sale would not be large. All the volumes are now said to be out of print, but probably the great libraries may have copies. In an article by Mr. Chanute on sailing flight, in the volume for 1896, he gives a long list of authors and publications on that aspect of the matter. There is also a bibliography near the end of the volume. The subject of sailing flight, to which Mr. Chanute's references apply, will probably come again to the front before long, as flying machines are perfected. Then the effort will be to imitate the flight of sailing birds by remaining aloft as long as possible with the motor stopped, deriving both support and driving power from the wind.

*The American Engineer and Railway Journal*, from October, 1894, to August, 1895, inclusive, contains, under the heading *Recent Aeronautical Publications*, a series of valuable lists. M. N. Forney, publisher, 47, Cedar Street, New York.

*Progress in Flying Machines*, by Octave Chanute, published by M. N. Forney, 47, Cedar Street, New York, 1894—long a standard work.

*L'Empire de l'Air*, by L. P. Mouillard, 1881. This is a record of years of observation on the flight of sailing birds.

*Experiments in Aerodynamics*, by the late Prof. S. P. Langley, 1891.

*The Internal Work of the Wind*, by Prof. Langley, 1893.

In regard to Professor Langley's two books, these are still in print. They can be obtained in London from Messrs. W. Wesley and Son, 28, Essex Street, Strand, who are the British agents for the sale of all publications connected with the Smithsonian Institution of Washington, D.C., United States (with which Langley was connected). I learn also that the following interesting collection is now on sale, and at a low price, and that it embodies many of the facts contained in Langley's larger works:—

*Researches and Experiments in Aerial Navigation*, by the late Prof. Langley. Plates and engravings. 8vo., 1908. 3s. net. (Consists of reprints and papers issued in the reports of the Smithsonian Institution.) Published in London, by W. Wesley and Son.

*Recent Experiments in Gliding Flight* is the name of an article by Mr. Chanute, published in *The Aeronautical Annual* of 1897, and in a pamphlet published a year or two later he described subsequent experiments.

*Some Aeronautical Experiments*, by Wilbur Wright, a paper read before the Western Society of Engineers (of America), September 18th, 1901. In the light of what has since happened, this paper is of extraordinary interest. It shows that in 1901 the Brothers Wright had evolved, in connection with their gliding machines, two at least of the main principles characteristic of their present motor-driven machines, namely, the forward horizontal rudder and the warping of the main surfaces to aid in steering and in lateral stability.\*

[\* This paper was reproduced in *The Automotor Journal* in February and March, 1902.—ED.]



*Navigating the Air* (a compilation, I think, by different writers), published by the Aero Club of America, 1907.

*Aerial Warfare*, by R. P. Hearne. Published by John Lane, London, 1908. An alarmist, but useful book.

*Aerodynamics, &c.*, by F. W. Lanchester. (Constable), 1908. A scientific and mathematical treatise.

Some of these older references may be useful to readers who are now going into the subject for the first time. They elucidate many main principles established by earlier investigations. For the same reason, I may be pardoned if I refer to four articles of my own which were published in the *Glasgow Herald* in 1897. I am emboldened to do so because, without any suggestion on my part, they were reprinted in pamphlet form by the Aeronautical Society for distribution among the members. These articles were designed to give the general reader, with as little technicality as possible, a comprehensive view of the whole subject as it then existed. As I had no engineering knowledge, I sought and obtained the assistance of the late Mr. P. S. Pilcher, who was then carrying on his gliding experiments. On the technical side, I believe these articles were correct, as he kindly revised them, and for beginners in the subject I should think they would still be of value. The idea of flying machines dropped out of sight in this country for two or three years after the fatal accident to Mr. Pilcher, but in America work continued. I again took up the subject from the general reader's point of view when interest began to revive here, and in several articles published within the last two years in the *Glasgow Herald* I have sketched events and prospects. I think it likely that anyone desiring in condensed and easily understood form a record of recent developments might find it of advantage to consult these articles. Consequently, I give the dates of publication:—*Flying Machine Development*, August 3rd, 1907; *The Coming Flying Machine*, October 12th, 1907; *Advent of the Flying Machine*, August 14th, 1908; *The Conquest of the Air*, August 27th, 1908; *The Achievement of Flight*, January 23rd and 30th, 1909.

Yours faithfully,  
ALEX McCALLUM.

Clapham, London, Feb. 1st.

## A METEOROLOGICAL OFFER TO AERONAUTS.

To the Editor of FLIGHT.

SIR,—As the result of long study, I have acquired a knowledge of the causes of wind and climatic conditions which, I claim, elevates meteorology to the status of a science, the which it is not as practised by others. The predictions of the meteorological departments all over the world are too speculative, the procedure being to ascertain by numerous telegrams the conditions obtaining at distant stations at a given time, then calculating which of those distant types of wind and weather is most likely to visit our locality during the ensuing 24 hours. Experience teaches us that such forecasts are generally wrong. My system recognises that every local wind is simply a branch from a great current, which latter I trace to its source. I have learnt precisely how and where the main currents are created, and when. I have learnt also what are the causes of local deviations from such main currents, and I am therefore equipped with special knowledge which enables me, as I have said, to predict the direction and approximate strength of carrying winds with greater certainty.

If any of your readers, sufficiently up-to-date to admit the possibility of such new discovery, and desirous of competing for any of many valuable prizes offered to aviators, will write to me I will—time permitting—assist him to select the most favourable time, when the wind will be most favourable for his aerial flight.

Yours sincerely,  
GERRARD H. HICKSON.

Feb. 7th.

## ANSWERS TO CORRESPONDENTS.

T.W.K.C. (Surbiton).—We are much obliged for your contribution to our bibliography. This will be embodied in it in due course.

E.C.C. (Laver Hill).—By all means bring the model for us to see. Any assistance we can give you is at your disposal. Thursday is our best day.

H.A.F. (Cambridge).—A reply is being sent direct by post.

R.L. (Stafford).—Our leader last week did not refer to any requests for advice or other individual assistance, but merely to the preparation and publication of articles of the character mentioned. See this week's leader.

A.Mc.C. (Clapham Park).—Very many thanks for further lists and other information, which will be incorporated later.

## MECHANICAL FLIGHT.\*

By E. STUART BRUCE, M.A.

OTTO LILIENTHAL, that gifted martyr of the air, tells us that in flying machines conception is nothing, construction is little, experiment is everything.

The year of 1908 will be memorable in aeronautical science for its demonstration of the possibility of mechanical flight. Day after day in France and America has been seen the spectacle of men, not holding in their hands an elaborate plan, not standing by some huge winged machine, but flying in the air with a grace equal to the soaring bird. This has been done with a machine not raised by the buoyancy of a gas, but with one that is heavier than the medium in which it travels, and whose sustentation and direction is accomplished by dexterity and skill.

It is, however, not without honour to the British nation, that one of the fundamental principles of the recent experiments was proposed and elucidated by a Briton in 1866. I refer to the important principle of superposed surfaces, advanced in that year by the late F. H. Wenham. He pointed out that the large monosurfaces necessary to carry a man are difficult of control, but that the lifting power of such a surface can be obtained by placing a number of small surfaces above each other. Wenham built flying machines on this principle, with appliances for the use of his own muscular power. He obtained valuable results as to the driving power of his superposed surfaces, but he did not accomplish flight.

It was in 1872 that H. von Helmholtz emphasised the improbability that man would ever be able to drive a flying machine with his own muscular exertions. After his statements there came a period of stagnation in aeronautical research. An all important link was then wanting; this was the light motor.

It is difficult to say how much aeronautical science owes to two illustrious names—Sir Hiram Maxim and the late Professor Langley. These two eminent men took up the subject of flight about the same time in the last decade of the last century, and applied to it all scientific knowledge of the time. Sir Hiram Maxim built the largest flying machine that has been constructed. It spread 4,000 sq. ft. of supporting surface, and weighed 8,000 lbs. The screw propellers were no less than 17 ft. in diameter, the width of the blades at the tip being 5 ft. The boiler was 363 h.p. The machine was run upon wheels on a railway line. It was restrained from premature flight by two wooden rails placed on each side above the wheels. But on one occasion the tendency to rise proved too strong for these measures of restraint. The machine burst through the wooden rails and flew for 300 ft. But Sir Hiram Maxim was not ready at that moment to fly further. When the machine took flight steam was shut off, the machine alighted and was damaged in the fall. The wisdom of Sir Hiram Maxim in not allowing the machine to take free flights was most commendable, for at that time the problem of the maintenance of equilibrium and stability was quite unsolved. But what could not be dared with a gigantic machine carrying human passengers, could be dared with an unmanned model. In 1896 Langley's tandem-surfaced model aerodrome had luck with the aerial currents, and flew for more than three-quarters of a mile over the Potomac River. This machine had 70 sq. ft. supporting surface, weighed 72 lbs., and had an engine of one-horse power, weighing 7 lbs. It is well known how in later years, Langley exaggerated his model into a machine which carried a man, and how twice when it was about to be put to the test over water, at the very moment of being launched, it caught in the launching ways and was pulled into the water. It is supposed that grief at not being able to put his work to a practical test hastened his death. But it is doubtful whether Langley's man-lifting aerodrome would have kept its balance had it escaped the clutches of the launching apparatus. In the light of recent experiments it has been seen that the maintenance of equilibrium and stability demands special contrivances.

It was the question of equilibrium which first led Lilienthal in Germany to experiment with what are called gliding machines. These are aeroplanes which are launched from some hillside against the wind, and depend upon gravity for their motive power. In this way the art of balancing can be practised on motorless gliders. With Lilienthal commenced the age of systematic experimental flight. It was Lilienthal who made the great discovery of the driving forward of arched surfaces against the wind. Lilienthal made some 2,000 glides. Sometimes from a height of 30 metres he glided 300 metres.

The underlying principle of maintaining equilibrium in the air has been recognised to be that the centre of pressure should at all times be on the same vertical line as the centre of gravity due to the weight of the apparatus. Lilienthal sought to keep his balance by

\* Abstract of a paper read before the Royal Society of Arts on Wednesday, December 2nd, 1908.



altering the position of his centre of gravity by movements of his body. But one day he was upset by a side gust and was killed. Pilcher, in England, took up his epoch-making work. With his soaring machines he made some hundred glides, but he also made one too many. One day, in 1899, in attempting to soar from level ground by being towed by horses, his machine broke, and he fell to the ground. He died shortly afterwards, and became a British martyr of the air. It is sad to relate these successive tragedies, but recent accomplishment has fully justified the actions of those who gave their lives for the sake of knowledge and progress.

The experiments of Mr. Octave Chanute, from 1896-1902, form important links in experimental flight. He first introduced the vital principle of making surfaces movable instead of the aviator, and he made use of superposed surfaces. Mr. Chanute had made an exhaustive study of the subject of aerial navigation, evidenced in his book "Progress in Flying Machines." He estimated aright the value of the researches of Wenham, whose original memoir on superposed surfaces he has described as "classical." He did not hesitate to adopt the principles advocated by Wenham in his own practical machines. He thus afforded an example of the expediency of studying the past as well as the present. As the earth contains hidden treasures unexcavated for centuries, but which from their intrinsic beauty eclipse the decadent specimens of modern handicraft, so, too, the annals of science contain hidden treasures—indispensable principles, which after years of oblivion have to be unearthed into the light of day.

In his multiple-winged machine Mr. Chanute fixed the wings on pivots. They retro-acted and swung horizontally so as to bring the centre of pressure to coincide with a vertical line passing through the centre of gravity. After making 300 glides with this he made a double-decked machine. It consisted of a rectangular bridge truss of wood, braced by steel wires, and carrying aerocurve surfaces arched  $\frac{1}{2}$ th on the top and bottom booms. An important feature was the rudder in the rear; it was attached to the machine by an elastic arrangement. The upper and lower surfaces of this rudder were acted upon by the wind gusts, and altered the angle of incidence of the main supporting surfaces. Seven hundred glides were made by Mr. Chanute's assistants with this machine without any accident. In 1902 Mr. Chanute devised a triple-decked machine, and in this the surfaces were pivoted to rock, fore and aft, on a stationary pivot.

The work of Mr. Chanute represents important stages in the evolution of the flying machine, but it was reserved to two other geniuses to bring human flight to a point of progress where the prejudicial critic would be for ever silenced. These two geniuses were the Brothers Wright. I will, therefore, speak of their work, beginning with their earliest experiments.

Before essaying practical flight, the Brothers Wright carried out laboratory experiments. It was in 1900 that they first began to experiment with gliding machines at Kitty Hawk, North Carolina. With the comparatively small surfaces (15.3 square metres) they used in that year, they endeavoured to raise the machine by the wind like a kite, but finding that it often blew too strongly for such a system to be practical, in 1901 they abandoned the idea and resorted to gliding flight.

These machines of 1901 had two superposed surfaces, 1.73 metres apart, each being 6.7 metres from tip to tip, 2.13 metres wide, and arched 1-19th. The total supporting surface was 27 square metres. They dispensed with the tail which previous experimenters had considered necessary. Instead they introduced into their machine two vital principles, upon which not only the success of their preliminary gliding experiments has depended, but also their recent ones with their motor-driven aeroplanes. 1. The hinged horizontal rudder in front for controlling the vertical movements of the machine. 2. The warping or flexing of one wing or the other for steering to right or left. Later a vertical rudder was also added for horizontal steering. The combined movements of these devices maintained equilibrium. The importance of the system of torsion of the main carrying surfaces cannot well be over-estimated. We have only to look to nature for its *raison d'être*. An instantaneous photograph of a flight of seagulls shows how varied are the flexings of Nature's aeroplanes in their wondrous manœuvres to maintain and recover equilibrium.

In the earliest machines of the Brothers Wright the flexing was attained by light strings held in the hands of the operator. In their recent machines a lever controls this as other accessory movements. The frame of the 1901 machine was of spruce wood and steel. With this machine about 100 glides were made from sand mounds, known as the Kill Devil Hills, at angles of 9 degrees to 10 degrees. A feature of those early experiments was the placing of the operator prone upon the gliding machine instead of in an upright position, to secure greater safety in alighting, and to diminish the resistance. This, however, was only a temporary expedient while the Wrights were feeling their way. In the motor-driven aeroplanes the navigator and his companion are comfortably seated. After the experi-

ments of 1901, the Wrights carried on laboratory researches to determine the amount and direction of the pressures produced by the wind upon planes and arched surfaces exposed at various angles of incidence. They discovered that the tables of the air pressures which had been in use were incorrect. Upon the results of these experiments they produced in 1902 a new and larger machine. This had 28.44 square metres of sustaining surfaces. Thus they showed they had attained to the use of surfaces of twice the area that previous experimenters had dared to handle.

An insight into the cautious and scientific methods by which the Wrights have reached their ultimate success is afforded by the tests which this new machine underwent before gliding flight was undertaken with it. The machine was first flown as a kite so that it might be ascertained whether it would soar in a wind having an upward trend of a trifle over 7 degrees. This was the slope of a hill over which the current was flowing. An experiment showed that the machine would soar under these circumstances whenever the wind was of sufficient force to keep the angle of incidence between 4 and 8 degrees. Hundreds of successful glides were afterwards made along the full length of this slope, the longest being 22½ feet and the time 26 secs. Glides were made at angles of descent of 6 degrees to 7 degrees, and the glider supported 66 kilogs. per horse-power.

The next step was to apply a motor and screw propellers in place of gravity. This was done in 1903, when four flights were made, the first lasting 12 secs., the last 59 secs., when 260 metres were covered at a height of 2 metres.

In 1904, several hundred flights were made, some being circular. All this work was carried on in a secluded spot and unpublished.

In December, 1905, the world was startled by the news that the Brothers Wright had flown for 24½ miles in half an hour at a speed of 38 miles an hour. Much more than this at the time the brothers would not say, and for three years the world thirsted for the fuller knowledge only this year revealed. In the interval some went so far as to distrust the statements of the Brothers Wright, but those who, like myself, had had the privilege of correspondence with them from their first experiments, felt the fullest confidence that every statement they had made was fact. This summer at Le Mans, in France, and Fort Myers, in America, Mr. Wilbur Wright and Mr. Orville Wright have demonstrated to the world the veracity of their former statements. At Le Mans, Mr. Wilbur Wright won the world's record of flight—1h. 31m. 25½s. This event was only two days after the news had arrived of the accident to his brother's machine in America in which Mr. Orville Wright broke his leg and Lieut. Selfridge was killed. This accident, of necessity, caused a temporary depression. I can myself bear witness as to its momentary depressive effect on an illustrious aeronautical assemblage. Had there not been the brother at Le Mans to vindicate the good character of the Wright machine, the disaster might have been another of those blows which retard progress. The accomplishment of Mr. Wilbur Wright's great feat at a time when his nerves must have received a severe shock was an example of the competency of the two geniuses who, of all aviators, have most forwarded aerial navigation.

In Wilbur Wright's machine at Le Mans, the two superposed slightly concave surfaces are about 12.50 metres long and 2 metres wide. They are separated by a distance of 1.80 metres. At a distance of 3 metres from the main supporting surfaces is the horizontal rudder for controlling the vertical motions. This is composed of two oval superposed planes. At 2.50 metres in front of the main supporting surfaces is the vertical rudder, composed of two vertical planes.

The 25-h.p. motor is placed on the lower aero-surface. This weighs 90 kilogs. There is no carburettor, the petrol being injected into airlet pipes. At the left of this motor are the two seats, side by side, for the operator and his companion.

The transmission of power to the two propeller-shafts is effected by chains running in guide tubes. The left-hand chain is crossed, to give the opposite movement to the propellers. The two wooden propellers at the back of the machine are 2.50 metres in diameter. They have a low rate of revolution—450 revolutions per minute. Perhaps the weakest part of the Wright machine is the material of the propellers—this is wood. To this fact would appear to be due the fatal accident to Mr. Orville Wright's machine in America. As is well known, Mr. Orville Wright had extended the length of those propellers. In rotating, one of them struck against a wire, hanging loosely, and was broken. Had the propeller been made of suitable metal, it would not, probably, have been broken by the impact.

(To be concluded.)

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**Aeronautical Patents.**

Applied for in 1908.  
 Published February 18th, 1909.  
 1,683. O. HEEREN. Aeroplanes